



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D212-664-101TRN
Job Sheet 170316



Part No: D212-664-101TRN

Job Qty: 1 ea

Part Name: Crosstube Turning Detail



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 1/15/18

Job Tracking No:

Due Date: 1/23/18

Created By: Mario Poulin

Type: Stock

Description:

Note: DWG REV E IPP Rev:A 08-03-06 new issue DD verified by:ec IPP Rev B 08.04.02 removed Polish EC verified by: DD

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea		1/22/18	0.00	0.00	Start Up Crosstubes-1		PMP
100	Mori Seiki	1 pcs		1/22/18	4.40	2.38	Mori Seiki TL-40		PMP
110	QC	1 pcs		1/22/18	0.00	0.00	QC2-1		PMP
120	Mori Seiki	1 pcs		1/22/18	0.00	2.38	Mori Seiki TL-40		PMP
130	QC	1 pcs		1/22/18	0.00	0.00	QC2-1		PMP
140	QC	1 pcs		1/22/18	0.00	0.00	QC8		PMP
145	Crosstubes	1 pcs		1/22/18	0.00	0.68	Crosstubes-1		GP
150	HandFXtube	1 pcs		1/23/18	0.00	1.00	Crosstubes-3		SA 18-03-07
160	QC	1 pcs		1/23/18	0.00	0.00	QC7-1		DLZ
170	Packaging	1 pcs		1/23/18	0.00	0.00	Packaging3-1		DLZ
180	QC21-SA	1 Ea		1/23/18	0.00	0.00	QC21		DLZ 18/03/21

Part Op 100 - 1- Fill tube with sand & install plugs 212-141 on both ends as per Folio FA113 - Turn first taper section on both
Descriptions: side as per folio FA113

120 - 1- Turn second taper on both side 4- Scribe part # and batch # using vibrating stylus on the cuff as per Dwg D212-664-141

145 - GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.

150 - 1- handfinish X-TUBE INSIDE AND OUT

170 - LOCATION : LG014

Job Allocations

Operation	Component Part	Required	Inventory	Allocated	Std Qty
90-Start up Operation	D6005-128	1	81	0	0

B123 963

Part Specifications

Specifications could not be found.

Plex 1/15/18 8:21 AM dart.poulin.mario

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	Skid-tube ☐
Part No. _____		Machining ☐
NCR No. _____		Thermoforming ☐
		Large Fab ☐
Date : _____	Step #: _____	QTY Effective _____

Description Work Order Deviation

Root Cause			
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐
Design ☐	Operator ☐	Bending ☐	Set-up ☐
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete ☐
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐
Past Expiry Date ☐	Manufacturing Process ☐		
Misidentified ☐	Past Due ☐	OTHER : _____	

Change No: _____
Operation: _____
Revision: _____
Original Serial #: S034580
PART NO: D212-664-101TRN
Start up Operation 01/23/18
Job No: 170316



S034580

DART AEROSPACE

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CANADA
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www.dartaerospace.com

☐ Flt Function
☐ Misaligned/off center

☐ Turning Sequence

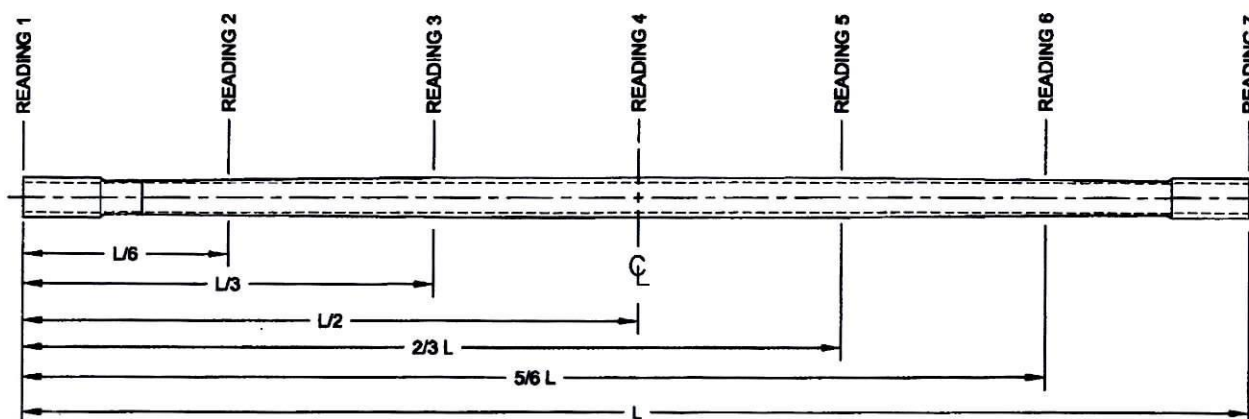
DART AEROSPACE LTD	Work Order:	170316
Description: Crosstube Assembly (205/212/412 High Fwd)	Part Number:	D212-664-141
Inspection Dwg: D212-664-141 Rev: E		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	.201	✓		VERN 08	
	R0.063	+/-0.010	.063	✓		RG	
	2.740	+0.005/-0.000	2.743	✓		VERN 08	
	5.097	+/-0.030	5.115	✓		"	
	2.304	+0.005/-0.000	2.3085	✓		BLM 3"-4" 04	
	2.340	+0.005/-0.000	2.3445	✓			
	2.398	+0.005/-0.000	2.4025	✓			
	2.448	+0.005/-0.000	2.4525	✓			
	2.498	+0.005/-0.000	2.502	✓			
	2.549	+0.005/-0.000	2.554	✓			
	2.599	+0.005/-0.000	2.604	✓			
	2.671	+0.005/-0.000	2.676	✓			
	2.701	+0.005/-0.000	2.705	✓			
SIDE B	0.200	+/-0.010	.201	✓		VERN 08	
	R0.063	+/-0.010	.063	✓		RG	
	2.740	+0.005/-0.000	2.743	✓		VERN 08	
	5.097	+/-0.030	5.107	✓		"	
	2.304	+0.005/-0.000	2.308	✓		BLM 3"-4" 04	
	2.340	+0.005/-0.000	2.344	✓			
	2.398	+0.005/-0.000	2.402	✓			
	2.448	+0.005/-0.000	2.452	✓			
	2.498	+0.005/-0.000	2.502	✓			
	2.549	+0.005/-0.000	2.554	✓			
	2.599	+0.005/-0.000	2.604	✓			
	2.671	+0.005/-0.000	2.676	✓			
	2.701	+0.005/-0.000	2.706	✓			
	126.514	+/-0.020	126.514	✓		TAP	

DART AEROSPACE LTD	Work Order:	
Description: Crosstube Assembly (205/212/412 High Fwd)	Part Number:	D212-664-141
Inspection Dwg: D212-664-141 Rev: E		Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L = 0"	382	381	381	377	.005	0.048"
READING 2 L = 21.09	242	243	240	242	.003	
READING 3 L = 42.17	348	352	358	357	.010	
READING 4 L = 63.25	382	383	384	384	.002	
READING 5 L = 84.34	345	356	364	358	.019	
READING 6 L = 105.43	231	240	253	248	.022	
READING 7 L = 126.514	371	377	387	384	.013	

Calibration Result

Actual Block Thickness: 200-400

Sitiescan 250 Measured Thickness: 200-400

Measured by: <u>PMP</u>	Audited by: <u>[Signature]</u>	Preliminary Approval:
Date: <u>2018-01-22</u>	Date: <u>18-02-26</u>	Date:

Rev	Date	Change	Revised by	Approved
C	07.05.28	Dwg Rev updated (P/O D412-664-101)	KJ/JLM	
D	10.02.02	Dimension 126.514 was 126.51	KJ	
E	12.06.04	Wall thickness form added	KJ	
F	14.06.05	Dwg Rev updated	KJ	<u>[Signature]</u>

Item	Qty -141	Qty -141B	Qty -141F	Part Number	Description
1	X			D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X		D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3			X	D212-664-141F	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD) (ANODIZED)
4	1	1	1	D6005-128	CROSSTUBE
5	2		2	D2893-1	SUPPORT
6	4	4	4	D3595-083-450	RUBBER CUSHION
7		2		D5017-1	SUPPORT
8	4	4	4	MS21920-25	CLAMP (OR MS21920-26)
9	A/R	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 128.514±0.020
- 2) FINISH -141 & -141B: a) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
b) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
c) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C8-2 / C8-3, HATCHED AREA)
d) PAINT OUTSIDE PER DART QSI 005 4.2
e) REMOVE MASKING AND APPLY MATTE CLEAR COAT
FINISH -141F: a) ANODIZE PER MIL-A-8625, TYPE II, CLASS 1.
b) ALODINE (DO NOT ETCH) PER QSI 005 4.1.2
c) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
d) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C8-2 / C8-3, HATCHED AREA)
e) PAINT OUTSIDE PER DART QSI 005 4.2
f) REMOVE MASKING AND APPLY MATTE CLEAR COAT
*NOTE: BETWEEN FINISHING OPERATIONS EXTREME CARE MUST BE TAKEN NOT TO
CONTAMINATE OR DAMAGE FINISHED SURFACES.
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING
VIBRATING STYLUS
- 7) WEIGHT: D212-664-141/-141B/-141F = 33.6 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST
BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005"
MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

MACHINING

- 10) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.

BENDING

- 11) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7.2%
(BASED ON O.D.) IN LOWER HALF OF R35.5 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 12) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

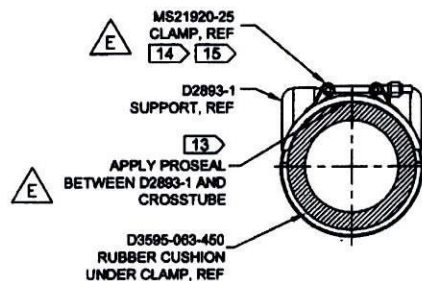
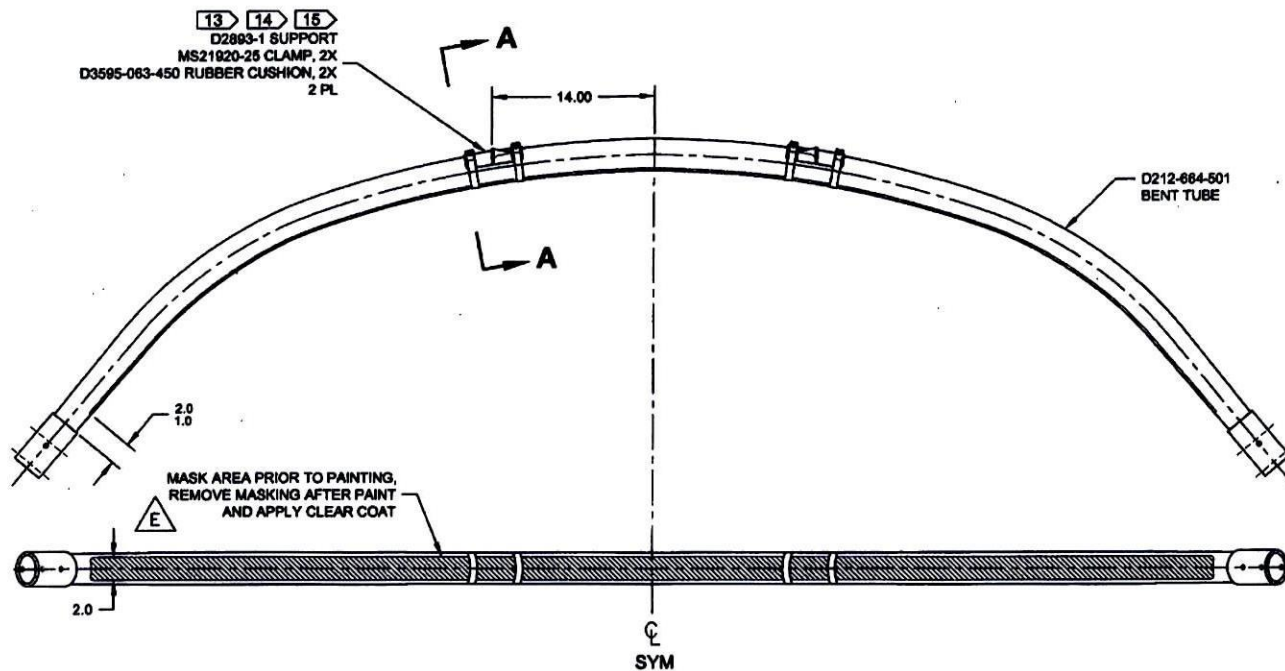
ASSEMBLY

- 13) TO INSTALL D2893-1 / D5017-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT
SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL
890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 14) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-083-450 RUBBER CUSHIONS TO SECURE THE SUPPORT ON TOP
SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT
BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890
SEALANT HAS CURED FOR 72 HOURS.

RELEASED
2014-05-26
WID

E	ADD -141F. D5017-1 WAS D2893-1 (-141B). PROSEAL WAS MAGNOBOND, NOTE 2: ADD INSPECTION WINDOW, NOTE 11: ALLOW 7.2% CRUSH, NOTE 15: ADD 72HR CURE AND RETORQUE FOR PROSEAL, ADD SHEET 3, CLAMPS REVERSED TO PREVENT CHAFING (B7-2, B7-3), BEND HEIGHT TOL. NOW 0.26 WAS 0.13 (C1-3), INCORP. DEO D-1/-2/-3	CP	14.04.01
D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C8-3, C8-3 & B5-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6388, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	CP	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	14.04.01		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D212-664-141	REV. E SHEET 1 OF 5
TITLE XTUBE ASS'Y (205/212/412 HI FWD)	SCALE NTS
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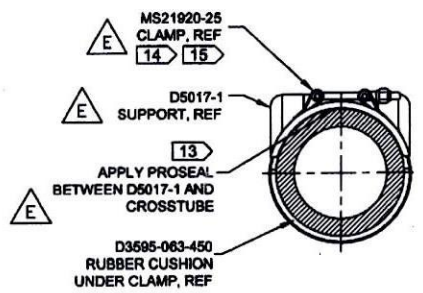
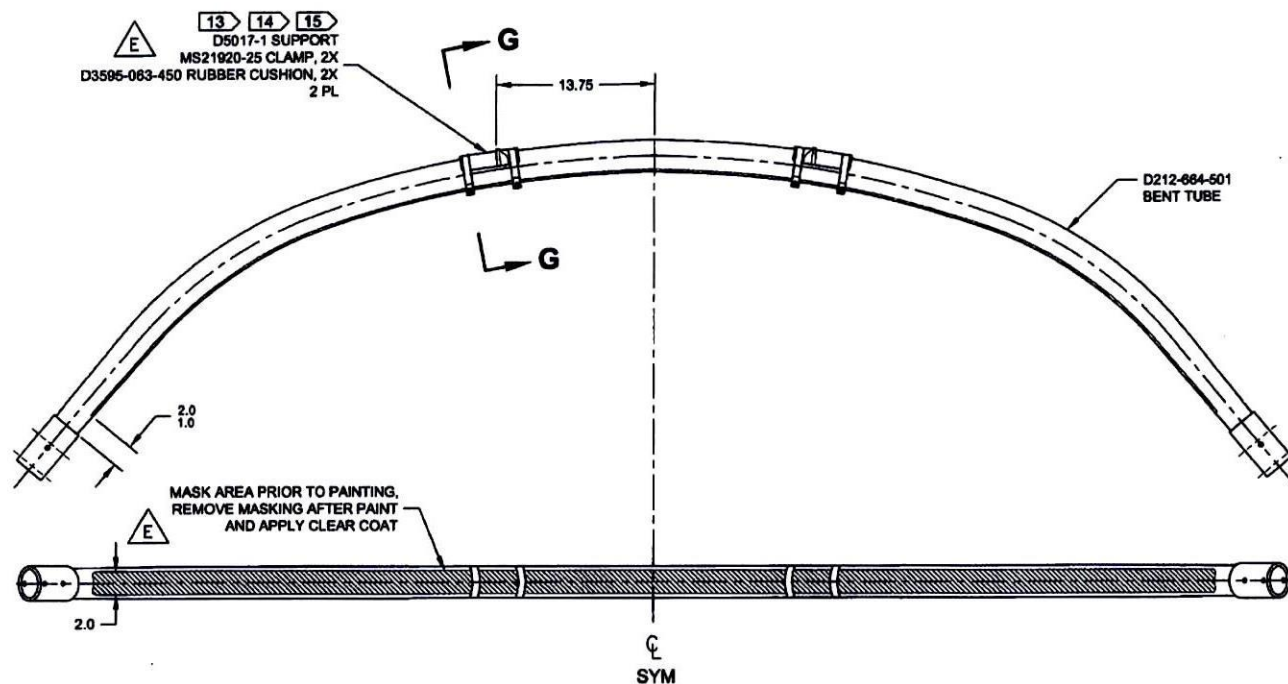


SECTION A-A
SCALE 4X

D212-664-141/-141F
ASSEMBLY DETAIL

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2014-05-26
AND

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CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D212-664-141	SHEET 2 OF 5
APPROVED		TITLE	SCALE
DE APPR.		XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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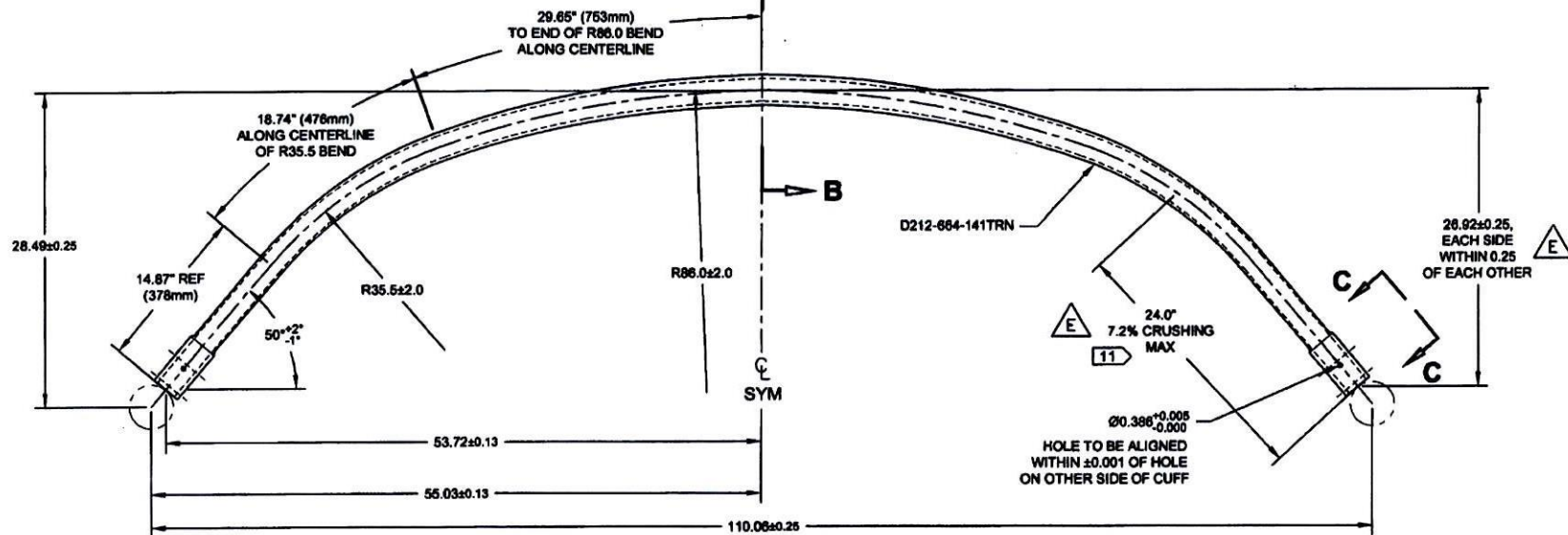


SECTION G-G
 SCALE 4X

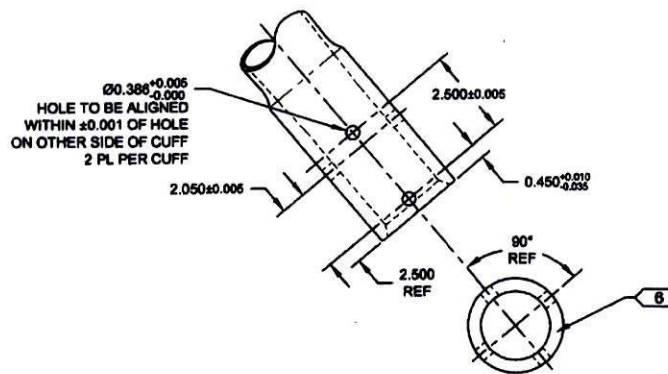
D212-664-141B
ASSEMBLY DETAIL

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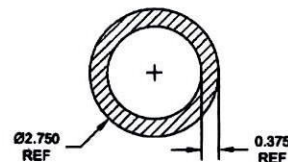
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DRAWN		HAWKESBURY, ONTARIO, CANADA	
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MFG. APPR.		D212-664-141	SHEET 3 OF 5
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D212-664-501
BENDING AND DRILLING DETAIL 11



VIEW C-C: CUFF DETAIL
SCALE 3X



SECTION B-B
SCALE 4X

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